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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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James H. Salter
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025

EXAMINER

CHOU, ANDREW Y

ART UNIT	PAPER NUMBER
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2192

MAIL DATE	DELIVERY MODE
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12/13/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/731,946

Applicant(s)

DAI ET AL.

Examiner

Andrew Y. Chou

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-26 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims rejection have been considered but are moot in view of the new grounds of rejection. See "SEWHA: A program for synthesis of pipelines" (hereinafter Sehwa).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7-8, 15-16, 25, and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7-8, 15-16, 25, and 26 recites the limitation "the delay branch" in line 1 of the claims. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1-26 are rejected under 35 USC 102(b) as being anticipated by "SEHWA: A Program for Synthesis of Pipeline", Nohbyung Park and Alice Parker, 1986 (hereinafter Sehwa).

Claims 1, 9, and 17:

As per claims 1, 9, and 17, Sehwa teaches a system (see for example FIG. 2-1, and related text), machine readable medium, and a method version of scheduling a sequence of instructions, comprising:

reading a target program (see for example page 454, "1.1 Pipelining", first paragraph, "In pipelining, each unit computation task is partitioned into a sequence of subtasks...");

identifying a pipeline control hazard in the sequence of instructions (see for example page 454, "1.1 Pipelining", paragraph 2, "...branch delays...resource conflicts also delays execution of the next computation task...");

selecting the sequence of instructions to re-order (see for example pages 456-457, "3. Scheduling Algorithms Used for Synthesis");

re-ordering the sequence of instructions by executing a backward scheduling method (see for example page 457, "3.2 Scheduling priority", second paragraph).

Claims 2, 10, and 20:

As per claims 2, 10, and 20, Sehwa teaches the system, machine-readable medium, and method version as recited in claim 1, wherein the pipeline control hazard is a

branch instruction (see for example page 454, "1.1 Pipelining", paragraph 2, "...branch delays...resource conflicts also delays execution of the next computation task...").

Claims 3, 9, and 21:

As per claims 3, 9, and 21, Sehwa teaches the system, machine-readable medium, and method version as recited in claim 1, further comprising:

performing the backward scheduling method prior to performing the forward scheduling method (see for example page 457, "3.2 Scheduling priority", second paragraph).

Claims 4, 10, and 22:

As per claims 4, 10, and 22, Sehwa teaches the system, machine-readable medium, and method version as recited in claim 1 wherein the forward scheduling method reorders at least one instruction within a delay slot (see for example page 457, "3.4 The feasible-scheduling algorithm", second paragraph).

Claims 5, 11, and 23:

As per claims 5, 11, and 23, Sehwa teaches the system, machine-readable medium, and method version as recited in claim 1, further comprising:

evaluating the forward scheduling method for a schedule failure (see for example page 457, "3.3 The maximal-scheduling and nonpipeline-scheduling algorithms"); and using the backward scheduling method result when the forward schedule method encounters the schedule failure (see for example page 457, "3.3 The maximal-scheduling and nonpipeline-scheduling algorithms", second paragraph, "If any other schedule results in a more expensive implementation...").

Claims 6, 12, and 24:

As per claims 6, 12, and 24, Sehwa teaches the system, machine-readable medium, and method version as recited in claim 1, further comprising:
packing the delay slot subsequent to executing the forward scheduling method (see for example Figure 2-1, "Overall operation of Sehwa").

Claims 7, 13, and 25:

As per claims 7, 13, and 25, Sehwa teaches the system, machine-readable medium, and method version as recited in claim 1 wherein the delay branch is a fixed length (see for example page 455, "2.2 Synthesis with a cost constraint", lines 1-4).

Claims 8, 14, and 26:

As per claims 8, 14, and 26, Sehwa teaches the system, machine-readable medium, and method version as recited in claim 1 wherein the delay branch is a variable length (see for example page 454, "1.1 Pipelining", paragraph 2, "...branch delays...resource conflicts also delays execution of the next computation task...").

Claims 18:

Sehwa teaches the system as claimed in 17, wherein the system is a computer system (see for example FIG. 2-1, and related text).

Claims 19:

Sehwa teaches the system as claimed in claim 17 further comprises as display device (see for example page 460, "7. Conclusion", second paragraph).

Conclusion


6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Y. Chou whose telephone number is (571) 272-6829. The examiner can normally be reached on Monday-Friday, 8:00 am – 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam, can be reached on (571) 272-3695.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is (571) 272 2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



TUAN Q. DAM
SUPERVISOR

AYC